

Climatological Data for September, 1910.
DISTRICT No. 8, TEXAS AND RIO GRANDE VALLEY.

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GENERAL SUMMARY.

The month of September, like the preceding month, was marked by persistently warm weather and by generally deficient precipitation. It was the warmest September in Texas during the last 23 years, while in New Mexico the mean temperature of the month was only a fraction of a degree less than the previous highest September mean recorded during the last 15 years. The precipitation of the month averaged much less in New Mexico and Colorado than it did in August, but there was a considerable gain in Texas. Droughty conditions, however, continued in many portions of Texas, and in some localities water had to be hauled by train and wagon from other points. A moderate excess of precipitation occurred over a limited area in the north-central portion of Texas from Shackelford and Coleman to Parker and Bosque counties, and a decided excess occurred in the lower coast counties and lower Rio Grande Valley; elsewhere in the district there was a conspicuous deficiency. In New Mexico the average precipitation was next to the lowest ever recorded in that territory. The rainfall was poorly distributed, being of the midsummer type with widely differing amounts in even near-by localities.

The greatest monthly precipitation in Colorado was 1.63 inch at Hermit; in New Mexico, 3.05 inches at Batesmans Ranch; and in Texas, 10.71 inches at Brownsville. There was no rain or only an inappreciable amount at one station in Texas and at five stations in New Mexico, while at six others in Texas and at four in New Mexico the monthly amounts were less than 0.10 inch. The least monthly amount in Colorado was 0.14 inch at San Luis. Excessive precipitation of 2.50 inches or more in 24 consecutive hours occurred as follows: Brighton, 6.83; Brownsville, 8.21; Brownwood, 5.28; Corpus Christi, 4.44; Dublin, 2.78; Falfurrias, 3.48; Grapevine, 3.05; Kopperl, 3.80; La Parra, 7.75; Laureles Ranch, 5.79; Llano Grande, 5.00; Midland, 2.50; Mission, 5.65; Panter, 2.61; Ricardo, 4.41; and Weatherford, 2.63.

The sunshine was abundant and averaged above normal. The number of days with 0.01 inch or more of precipitation averaged 5 in Colorado, 3 in New Mexico, and 4 in Texas.

TEMPERATURE.

The monthly mean temperature was 3.3° above normal in Colorado, 2.8° above in New Mexico, and 3.5° above in Texas, the excess of temperature ranging from less than 2° on the Gulf coast to over 6° in northeastern Texas and in portions of the lower Rio Pecos and lower Rio Grande valleys. The change in temperature from day to day was unusually small, and no cool spells of importance occurred during the month. In the greater portion of the district the warmest weather occurred during the first decade and the coolest during the third decade. The diurnal range of temperature varied from about 8° on the upper Texas coast to about 42° in the extreme northwestern portion of the district.

The highest and lowest temperatures reported were: In Colorado, 90° at Saguache on the 8th, and 19° at Hermit on the 28th; in New Mexico, 104° at Carlsbad on the 3d, and 26° at Red River Canyon on the 26th; and in Texas, 107° at Fairland on the 1st, at Haskell on the 3d and 4th, and at Tilden on the 18th, and 45° at Plainview on the 27th. The local monthly means ranged from 57.0° to 60.4° in Colorado, from 48.2° to 76.8° in New Mexico, and from 71.1° to 85.4° in Texas.

PRECIPITATION.

The rainfall over the Rio Grande watershed was decidedly deficient, except over the extreme lower portion which received from 5.00 to 10.00 inches south of Fort McIntosh. Notwith-

standing these heavy amounts the average for the entire watershed was only 1.23 inch, which is nearly 1.00 inch less than the average for the preceding month.

The average for the Rio Pecos watershed was only 0.86 inch, or over 2.00 inches less than the August rainfall. The deficiency of precipitation covered the entire watershed.

Heavy rains occurred over the lower portions of the coastal plains, but the upper coastal plains and the other watersheds of the district showed a marked deficiency of precipitation, the shortages ranging from 0.77 inch for the Colorado to 2.40 inches for the Sabine. There were, however, a few limited areas in the upper portions of the Colorado, Brazos, and Trinity valleys and in the lower portion of the Guadalupe Valley where the monthly amounts exceeded the normal. The following are the average monthly amounts in inches for the various watersheds: Nueces, 1.08; San Antonio, 0.98; Guadalupe, 2.11; Lavaca, 2.85; Colorado, 2.12; Brazos, 1.37; Trinity, 1.57; Neches, 1.70; Sabine, 0.97; and coastal plains, 4.41. These amounts are much greater than those reported for the preceding month, except in case of the Sabine watershed which showed a decided decrease.

RIVER CONDITIONS.

The Rio Grande was rising in its lower portion at the close of August and subsequent heavy rains caused it to overflow, but the flood waters did not reach the high stage of September, 1909. A report of the flood will be found in another chapter of this paper. The upper Rio Grande and the Rio Pecos were unusually low during the month, owing to lack of seasonal rains in the mountains. At the Leasburg Project the water supply during the month was insufficient. At the Hondo Project there was but little water available for irrigation. At the Carlsbad Project, however, water was delivered throughout the month, the total furnished amounting to 4,826 acre-feet.

The volumes of water discharged by the Colorado, Brazos, Trinity, and Neches rivers were slightly greater than during August, while the volume discharged by the Guadalupe was about the same, and that of the Sabine much less. Sharp rises of about 10 feet occurred in the Colorado and Brazos rivers from the 6th to the 12th. The stages of the Guadalupe and Sabine rivers are the lowest on record for September.

MISCELLANEOUS.

Frosts.—A general light frost occurred in the northern districts of New Mexico on the 27th, which was probably the coldest day of the month, and killing frosts occurred at a few of the higher northern stations, but the season was so far advanced that little or no damage resulted. Last year killing frosts were reported from New Mexico on the 13th and 14th of September, and light frosts from Texas stations on the 28th and 29th of September. So far this season there has been no frost in Texas.

Cloudburst.—Torrential rains occurred in Comanche County, Tex., on the 5th and 6th, which caused a disastrous flood of the Leon River, a tributary of the Brazos. According to press dispatches a wall of water 25 feet high swept down the narrow channel of the river, carrying death and destruction in its path. A number of houses were swept away, 13 persons lost their lives, and much damage was done to live stock and crops.

FLOOD OF THE LOWER RIO GRANDE.

The flood of the lower Rio Grande was caused by heavy rains which occurred on September 14 in the southern portion of Texas and in contiguous portions of Mexico, attending a tropical disturbance moving inland south of Nueces County. At Corpus Christi the wind attained a velocity of 61 miles per hour from the east on the 14th, but there was very little wind at Brownsville, and it appears that the disturbance broke up over the lower



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Rio Grande Valley, its energy being converted into a torrential downpour. From 4 to 8 inches of rain fell in 24 consecutive hours on the 14th in Nueces, Cameron, Hidalgo, and Starr counties. By the morning of September 16 the river had risen 17 feet at Mission and warnings were immediately telegraphed to all points below. Flood stage was reached at Mission on the 19th, and the crest of the high water reached Brownsville on the 23d. The high water mark of the flood of September, 1909, which also resulted from torrential rains attending a tropical disturbance, was not reached by several feet, and the damage appears to have been comparatively slight. The following are reports of the flood received at this office:

Mission, Tex.—On September 14 5.65 inches of rain fell at Mission in 24 consecutive hours, and between Mission and Brownsville the rainfall for the corresponding period was much heavier. The river reached flood stage on the morning of September 19, when it was 26 feet 10 inches above the lowest known water this year. There being no river gage it was difficult to ascertain how this year's flood compares with that of last year, but from those who have been close observers of the river for many years, it is learned that the high water of 1909 exceeded that of this year by about 4 feet.

The heavy rainfall filled up all the low places and resaca beds in advance of the rise in the river, and when the river started to rise there was a vast volume of water that broke through the banks about 4 miles west of Mission and followed the resacas between the railroad and river down to the Arroyo Colorado. A great amount of this water passed over the railroad track east and west of Mercedes and found its way through the back country to Lyford and vicinity.

Out of a tract of 27,000 acres, 3 miles wide and 14 long at Mission, about 1,800 acres were inundated. Of this number less than 100 acres were planted to crops, mostly dry beans, which were promptly replaced with winter cabbages.

The train service on the Hidalgo Branch was irregular for less than one week, and for two successive days there was no mail delivery. After regular service was resumed on the branch line, the main line roadbed between Raymondville and Harlingen became very soft and in several places the ties and rails had sunk level with the surface of the ground.—*L. H. Romig.*

Llano Grande, Tex.—The recent flood was not as great as the one we had in September, 1909, by about $6\frac{1}{2}$ feet. We suffered no damage here, while it has been reported that some of the canals farther up the river were slightly damaged. A few farmers suffered considerable damage to their crops, which consisted chiefly of California beans and of seed beds for winter truck.—*M. D. Wardlow.*

Brownsville, Tex.—Last week I made a trip through the valley to note the effect of the flood and found that the river made a total rise of 27 feet at Mission, overflowing into the resacas at that place on September 18. The water took an easterly course through the Mission tract, covering an area probably 2 miles wide. About 125 acres of crops were entirely destroyed and a great deal of plowed and prepared land was overflowed. The water meandered in an easterly and northeasterly direction, its greatest height being just west of Mercedes on September 21.

At Mercedes the water was 3 miles wide and it was necessary to cross the place by means of boats. The water swept in on the north side of Mercedes and covered the low ground up to the railroad track. This portion of the town is populated by Mexicans chiefly. The remainder of the town was not troubled by the water, except a few houses in the extreme western portion.

The water reached Harlingen and backed up toward town on the west side September 24, but was held back by levees. Some fields a mile west of town were 4 feet under water. The bulk of the water, which passed west of Mercedes, reached the low ground south of Lyford and crossed the main line of the St. Louis, Brownsville and Mexico Railroad on September 26, and traffic was disturbed. There was not the quantity of water in the overflow this time that there was in the second overflow of last fall. The overflow this year is estimated generally as being half way between the first and last overflows of last year.—*E. C. Green.*

Brownsville, Tex.—The Rio Grande was approximately $17\frac{1}{2}$ feet below bank on September 1. On the 2d the river began to rise and reached its highest mark this year at Brownsville on September 23, having risen 15 feet 10 inches. A warning was received from Mission, stating that the river had risen 15 feet in 12 hours on the night of September 1. On September 16 another warning was received announcing a rise of 17 feet in 12 hours. A considerable portion of the land up the valley between Brownsville and Mission was flooded. The towns of Mission and Mercedes suffered from flood, but not to such a degree as last year. About 125 acres of crops were

ruined and much cleared land will have to be replowed on account of the overflow. The flood water was kept out of Brownsville by means of levees. The main line of the St. Louis, Brownsville and Mexico Railroad near Lyford was out of commission for a short time on account of softened roadbed, and the branch line was flooded in several places.—*R. M. Boss.*

CONSERVATION OF FLOOD WATERS OF THE COLORADO RIVER.

The deficiency of precipitation over the Colorado watershed during the past summer, and the consequent low stages of that river, which broke all previous records for low water, have resulted in a strong agitation for a conservation of the flood waters of that stream. It is very probable that steps will be taken in the near future to prevent a repetition of the losses sustained this year as a direct result of the shortage of water. There are extensive rice fields in Colorado, Wharton, and Matagorda counties, which are irrigated from the waters of the Colorado River. During the past season the flow of the river was so low that irrigation became impossible. The irrigation plants had to suspend operation, and the rice crop suffered accordingly. From the best information available it appears that Matagorda County alone produces annually from 550,000 to 600,000 bags of rice. This year, on account of the drought, the production of rice in that county was reduced to about 100,000 bags—a decrease of 450,000 or 500,000 bags. At a market value of \$2.25 per bag, this would mean a loss of over \$1,000,000. With proper conservation and utilization of the waters of the Colorado River, much of this loss, if not all, could have been avoided.

The Colorado River rises in the western portion of Texas near the eastern boundary of New Mexico, flows in a general southeasterly direction, and empties into the Gulf of Mexico in Matagorda County. Its drainage area is 45,400 square miles. The stream emerges from a canyon at Austin, but south of that city it traverses a rather flat country. Its principal tributaries are the Concho, San Saba, and Llano. The Concho has a reliable flow and furnishes water for irrigation and for power. The San Saba rises in two springs near Fort McKavett in the western part of Menard County and flows in an easterly direction for over 100 miles to its junction with the Colorado. The Llano drains the territory east of Sonora and northeast of Rocksprings and joins the Colorado about 20 miles southeast of the town of Llano. Its waters are utilized for irrigation purposes.

The Colorado River has a more rapid flow than any of the other streams in Texas. The great dam at Austin, which was constructed at a cost of about \$1,000,000, and was broken by a flood on April 7, 1900, is to be rebuilt. It was 1,250 feet long and 60 feet high. The dam at Marble Falls is nearing completion. It will be much higher than the natural dam, which has heretofore been utilized for water power. These dams will probably have a tendency to regulate the flow of the river below.

That there is a great amount of water discharged by the Colorado River, which could be made useful if properly conserved, is shown by the Weather Bureau records of the river stages at Columbus, Tex. The records show that in the last 7 years the river has been above flood stage at Columbus 14 times, and has been nearly bank full a number of other times. During this period flood stages obtained 5 times in May, 3 times in June, twice in August, and once each in April, July, October, and November. The lowest stages occur usually during the winter months. The present drought was preceded by a good flow in May, 1910, when the river attained a stage of 25.5 feet, which is 1.5 foot above flood stage. This water would have been of great value if it could have been impounded and utilized during the subsequent droughty season.

TABLE 2.—*Daily precipitation for September, 1910. District No. 8—Continued.*

